

Infrared Imaging Spectroscopy of Asteroid 243 Ida and Discovery
Spectra of Satellite 1993 (243) 1.

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During the August 28, 1993 flyby of 243 Ma, the Near Infrared Mapping Spectrometer (NIMS) observed the asteroid using a variety of spectral imaging modes and geometric conditions. Within the NIMS special range (0.7 to 5.2 μm), the observed radiation arises from both reflected sunlight and thermal emission. The highest spectral coverage measurements (408 and 102 wavelengths) show absorption features at 1 and 1.9 μm due to iron bearing forms of the silicate minerals olivine and orthopyroxene. Of these two, the absorption strengths indicate that olivine is the more abundant species. Measurements obtained at the highest spatial resolution (1.8 km) obtained near closest approach show very little spectral variation over the face observed. A spectrum obtained 2½ hours earlier, corresponding to the average of the opposite hemisphere, is similar but with larger error limits.

Evidence for an accompanying satellite was discovered in a 102-wavelength NIMS imaging scan. These spatially unresolved spectra, and other 17-wavelength sub-pixel spectra, show qualitative differences with those of Ida. Ratio spectra show a relatively narrow absorption band shortward of 1 μm and a weaker, broader band centered at about 2.3 μm . These results suggest that the satellite contains more pyroxene, relative to Ida, and that it may contain roughly equal amounts of orthopyroxene and clinopyroxene.